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DOOR FRAME SECTION

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(56) Prior Art Documents
AU 519282 37792/78 E06B 3/06 3/42
AU 289828 43873/64 E06B 3/16 81.5 78.71
AU 148117 37689/50 E06B 3/16 81.5 78.71

(57) Claim

1. An extruded or roll-formed frame member the integral parts of which extend longitudinally in the direction of formation of said member and include a body portion having at least one tongue section which extends laterally in relation to the direction in which the frame member is formed, which is relatively shallow in depth compared with its lateral dimension, and which has a hollow interior defined by opposed inner and outer walls which merge with an end wall at least at their ends remote from the body portion, said frame member further including an arm section spaced from but linked by a further end wall to the inner wall of each tongue section to define an open-mouthed frille rebate between said arm section, said linking end wall and said tongue section inner wall, the arm section and tongue section inner wall defining opposed side walls of said grille rebate, said opposed side walls lying with at least part of their opposed surfaces substantially parallel and wherein the outer end portion of at least one side wall of the grille rebate is offset so as to be spaced outwardly from the interior of the grille rebate whereby the side wall so constructed has at least two portions extending parallel to the opposed side

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wall with the outermost such portion being spaced at a greater distance from the opposed side wall than its adjacent such portion.

15. A method of constructing an insect screen, wherein a plurality of frame members as claimed in any o.e of claims 1 to 8 are joined to provide an enclosure for the edges of a panel of insect screen mesh, the edges of said panel are inserted into the grille rebates of the respective frame members, and at least one retaining piece is inserted between the offset portion of the side wall of the grille rebate and the screen mesh panel thereby removably retaining the edges of the mesh panel within the rebates.

INSTRUCTIONS

(a) If Convention application insert "Convention"

(a)

AUSTRALIA

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(b) Delete one

APPLICATION FOR A (b) STANDARD ~~PATENT~~ PATENT

(c) Insert FULL name(s) of applicant(s)

~~I~~/We (c) McIlwraith-Davey Pty. Ltd.

(d) Insert FULL address(es) of applicant(s)

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Richmond, Victoria 3121,
Australia

(e) Delete one

hereby apply for the grant of a (e) Standard ~~Patent~~ Patent for an invention entitled

(f) Insert TITLE of invention

(f) EXTRUDED OR ROLL-FORMED SECTION

(g) Insert "complete" or "provisional" or "petty patent"

which is described in the accompanying (g) provisional specification.

(***Note**: The following applies only to Convention applications)*

Details of basic application(s)

(h) Insert number, country and filing date for the or each basic application

	Application No.	Country	Filing Date
(h)			

Address for Service: PHILLIPS ORMONDE AND FITZPATRICK
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(i) Insert date of signing

Dated (i) 9 June, 1989

(j) Signature of applicant(s) (For body corporate see headnote*)

(k) Corporate seal if any

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Note: No legalization or other witness required

v. Case No. P 446/89
:AP

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NOTICE OF ENTITLEMENT

We, McILWRAITH-DAVEY PTY LTD of 34 York Street, Richmond, Australia state the following in connection with Australian Application No. 56963/90.

1. The actual inventors are:-

   Malcolm Douglas Campbell of Sarnia Farm Road, St Agnes, South Australia, Australia; and

   Keith Richard Miller of 15 Mary Street, Mitchell Park, South Australia, Australia.

2. The applicant and nominated person is the assignee of the actual inventors.

DATED: 24 August 1992

McILWRAITH-DAVEY PTY LTD
By PHILLIPS ORMONDE & FITZPATRICK
Patent Attorneys for the Applicant
per:

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TO: The Commissioner of Patents
WODEN ACT 2606

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COMPLETE SPECIFICATION

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APPLICANT'S REF. CAP OF PJ 4671/89

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Complete Specification for the invention entitled:

DOOR FRAME SECTION

The following statement is a full description of this invention, including the best method of performing it known to pplicant(s):

This invention relates to the construction of screens, doors and windows and is particularly concerned with the form of the members which can be used to make up the frames of such screens, doors and windows, particularly security doors and windows.

Security doors and windows presently in use are commonly formed with frame members of extruded or roll-formed metal, such as aluminium. The frame members may include a hollow box section which provides most of the strength for the frame and also allows the fitting of a lock and of handle furniture as appropriate.

The extruded and roll-formed frame members presently in use also include a first rebate section into which the edge portions of a security grille can be inserted. A second rebate section which can be adapted to hold insect screen mesh is also commonly provided in the conventional frame members.

The security grille commonly consists of an expanded or otherwise formed metal mesh having apertures of such a size and shape as to prevent a person reaching through the grille. Insect screen mesh such as a "fly wire" of metal or fibreglass reinforced plastics threads is commonly held in the second rebate section by forcing the edge of the mesh into the rebate and holding it there with a spline of flexible material or of rigid extruded plastic or metal angle.

In order to make a security door or window of satisfactory quality and strength, certain minimum requirements must be met as far as the box section dimensions, the depth of the first rebate and the frame weight per lineal measurement are concerned. In standard security door constructions, the box section width must be sufficient to hold lock and handle furniture. The first rebate for the security grille and the second rebate for the insect screen mesh add to the overall width of the frame member. In order to conserve material and to maintain an aesthetically satisfactory appearance, the width of the first rebate has often been reduced with the result that the

depth of the rebate to hold the security grille is insufficient to resist removal forces which may be applied to the grille.

The provision of the desirable second rebate for insect screen mesh not only increases the total width of a standard security door frame member. The second rebate extends across the width of the frame member between the box section and the first rebate, linking these two components with a single thickness of metal at the base of the second rebate. The base of the second rebate is thus the weakest area of the frame member. As the second rebate is generally formed in the surface of the member which faces inwardly when the door is mounted, outwardly directed removal forces applied to a grille mounted in the first rebate cause a bending moment in this weakest area. Increasing the width of the first rebate (to increase the depth to which the security grill can be mounted) leads to an increase in this bending moment.

Thus the basic requirement for security must take these various factors into account. For example, the strength and appearance of the door must be balanced against avoiding excessive weight and the excessive use of materials which will increase the cost of the product and make it commercially unattractive. In addition, the ease of assembly to reduce the cost of manufacture and installation must be balanced against the resistance of the product to forced entry, for example by removing the grille from the frame.

It is an object of the present invention to provide an improved screen, door and window construction which will enable the standards for quality and security to be met while at the same time providing a product which can be readily assembled to form a final product of satisfactory strength.

In accordance with the present invention there is provided an extruded or roll-formed frame member, the integral parts of which all extend longitudinally in the direction of formation of the member itself. The frame

member includes a body portion having at least one hollow tongue section. The or each tongue section extends laterally in relation to the direction in which the frame member is formed and the depth or thickness of the tongue member is relatively shallow compared with its lateral dimension. The tongue section has a hollow interior defined by opposed inner and outer walls which merge with an end wall at least at their ends remote from the body portion.

The frame member of the invention further includes an arm section spaced from but linked by an end wall to the inner wall of each tongue section. The inner wall of the tongue section, the arm section and the linking wall thus define an open mouthed grille rebate into which an edge portion of a security grille or other screen material can be inserted. The opposed side walls of the grille rebate formed by the inner wall of the tongue section and the opposed arm section lie with at least part of their opposed surfaces substantially parallel. At least one of these surfaces is preferably formed with a plurality of inwardly directed longitudinally extending parallel ribs. These ribs are preferably barbed in cross section with the points of the barbs directed inwardly towards the end wall of the grille rebate. The innermost portions of the ribs contact the inserted edge portion of the security grille and resist the removal of the grille from the grille rebate.

At least one side wall of the grille rebate, preferably the side wall formed by the arm section, ~~may have~~ has its outer end portion offset. In this construction, the offset portion of the side wall is spaced outwardly from the interior of the grille rebate so that the side wall so constructed has at least two portions extending parallel to the opposed side wall with the outermost such portion being spaced at a greater distance from the opposed side wall than its adjacent such portion.

When a security grille or other screen material is inserted into the grille rebate having an offset portion in one side wall, the edge portions of the security grille lie between the opposed side walls in the narrower portion of

the grille rebate leaving a gap between the security grille and the outermost portion of the offset side wall. This gap allows the insertion of a retaining piece or pieces, for example a continuously extending strip of appropriate material such as plastics material, which resists the tendency of the security grille to rattle in the grille rebate.

The retaining piece or pieces may also be used to hold the edge portions of an insect screen mesh within the grille rebate. The use of the construction just described provides an improved mounting for insect screen mesh and brings the screen mesh into direct abutment with the security grille. The insect screen mesh is thus held more firmly and the appearance of the screen mounting is also improved. The construction also allows the use of heavy duty insect screen mesh, such as that sold under the trade marks "Microtech" and "Lookout", which is less suitable for insertion into and retention within a screen mesh rebate as described above for conventional door and window frame members.

Although particularly well adapted to use in screen constructions in which both security grille and insect screen mesh are held together in the grille rebate by retaining pieces, the grille rebate may be formed to hold only a panel of insect screen mesh and appropriate retaining pieces. Thus the width of rebate designed to accomodate both security grille and insect screen mesh can be reduced to substantially the screen mesh width where frame constructions for insect screens only are required.

The outer portion of a side wall of the grille rebate may be offset by extending an intermediate portion of the side wall away from the opposing side wall and then returning the outer portion of the side wall to lie parallel with the opposing wall. Preferably however, a relatively shallow stiffening rebate is formed in the side wall formed by the arm section. The rebate thus formed in the outer surface of the arm section also brings the inner surface of the rebated arm section closer to the opposing side wall of the grille rebate, making the outer portion of the arm

section relatively offset from the stiffening rebate.

When the frame members of the present invention are used to construct a security grille frame, the security grille can be held within the grille rebate. Preferably the security grille is positively retained by rivetting through the side walls of the grille rebate. This additional retention of the security grille is particularly desirable with more flexible security grille materials. The hollow tongue section in the frame members of the present invention allows the rivet tails to be concealed in the interior of the tongue section and thus substantially improves the appearance of the completed product. If a stiffening rebate is provided in the arm section of the frame member, this will not only provide added stiffness to the arm member and assist in avoiding local distortion under the rivet clamping force but will also provide a rec :s within which the heads of the mounting rivets can be accomodated flush with the exterior of the frame member.

Where the frame member is to be used as part of a screen, door or window which requires the mounting of a lock and/or handle furniture, the frame member preferably also includes a hollow box section which merges with the tongue section and from which the tongue section extends outwardly. The box section will not only provide an appropriate area for mounting of a lock and/or handle furniture, but also strengthen the frame member as a whole. The form of the box section depends on the end use for which the frame member is required.

Thus, the box section of a member which is to form part of a door surround frame will usually differ in form from the box section of a member to form a mid rail for a door or window. The form of the box section for a member to form a window surround frame will usually be different again. For a surround frame member, the hollow tongue section of the invention may extend outwardly from a box section. The hollow interior of the tongue section may merge with the hollow interior of the box section or the two hollow interiors may be separated by a mutual dividing

wall. For a mid rail frame member, two tongue sections may be provided with their inner ends adjacent and preferably merged so that the hollow interior of the respective tongue sections merge.

The inside walls of the box section are preferably formed with shallow ribs to assist the location and retention of corner stakes used in the assembly of the frame structure. The tolerance between the corner stakes and the interior of the box section is thus less critical because the locating ribs can be sheared readily during assembly if necessary to accomodate a slightly oversize corner stake.

Frame members made in accordance with the present invention can also include at least one screen mesh rebate. The screen mesh rebate will preferably extend transversely to the direction of the grille rebate and will be of sufficient depth to allow for the retention of insect screen mesh material and a spline to hold this material within the screen mesh rebate. The screen mesh rebate is prefe[illegible]ly formed with ribs on its opposed inner walls and these ribs are preferably barbed to assist retention of the screen mesh and spline.

In the accompanying drawings, three examples are shown of frame member constructions which, embody the features of the present invention. It is to be understood that these examples are given for the purpose of illustration only and that the invention is not limited to the combination of features illustrated.

In the drawings, Figure 1 is an illustration of a frame member suitable for use in the construction of a door surround frame, Figure 2 is an illustration of a frame member suitable for use as a mullion in a door or window frame construction and Figure 3 is an illustration of a frame member suitable for use in a window frame construction. Figure 4 is a similar illustration of a conventional frame member as currently used in security door construction.

In Figures 1 to 3 of the drawings, grille rebate 1 is shown as defined between tongue section 2 and arm section

3. Respective side walls 4 and 5 are formed with ribs 7 which are generally barbed inwardly towards end wall 6. The arm section 3 of the members shown in Figures 1 and 2 includes stiffening rebate 8. This rebate, which is a feature of the present invention, is not shown in Figure 3.

3. Respective side walls 4 and 5 are formed with ribs 7 which are generally barbed inwardly towards end wall 6. The arm section 3 of the members shown in Figures 1 and 2 includes stiffening rebate 8.

The respective door and window frame members of Figure 1 and 3 include hollow box section 9. In these illustrated embodiments, the hollow interior of the box section 9 merges with the hollow interior of the tongue section 2. The hollow interior of the two tongue sections 2 in the mid rail of Figure 2 are also shown as merging. It should be appreciated however that increased stiffness for the member could be provided by extending end walls 6 to the outer wall of tongue section 2 in any of these illustrated embodiments.

Box section 9 of the member in Figure 1 is shown as including corner stake locating ribs 10. The members of Figures 2 and 3 include screen mesh rebates 11.

The current type of conventional frame member for a security door illustrated in Figure 4 includes first rebate 1' into which the security grille is inserted, second rebate 11' into which screen mesh and its holding spline can be inserted and box section 9'. The section forming the security grille rebate 1' is attached to the box section 9' through the section forming the base wall 12 of the screen mesh rebate 11'.

It will be noted that the ratio of the depth to width of the security grill rebate in the frame member section of Figure 4 is approximately 2:1 while the corresponding ratio in the frame members of Figures 1 to 3 is approximately 3.3:1. In other words there is a 65% increase in the depth of rebate available to retain the security grille in the frame members illustrative of the present invention.

Owing to the limited depth of rebate available in the conventional constructions as illustrated in Figure 4, it is generally considered necessary to assist in retaining the security grille within the rebate by passing a rivet through at least one side wall of the grille rebate and also through the material of the security grille itself. As the protruding tails of a rivet or other securing member are

rather unsightly, the general practice is to pass the rivet only through the outer side wall of the grille rebate and to retain the rivet tail within this rebate. In conventional constructions the securing rivet is subject to a single shearing action and is thus distorted or broken fairly readily if an attempt is made to remove the security grille.

By contrast, the present invention allows the use of longer rivets which can be passed through both side walls of the grille rebate with the rivet tails remaining concealed within the tongue section 2. As the security grille is held more securely by the deeper grille rebates of the present invention, it is also not necessary for the rivets, if used, to actually pass through the security grille material. Accordingly, the diameter of the rivets used is not limited by the otherwise necessary consideration of allowing the rivets to pass through the security grille material without unduly weakening this material. Rivets used in the frame members of the present invention which pass through both side walls of the grille rebate are further adapted to better resist removal of the grille because the removal forces applied to the grille must shear the rivet in two areas to break or distort the rivets sufficiently to permit removal of the grille material.

The tongue 2 which is a feature of the present invention adds further strength to the frame member construction and to the security of the door, window or other screen of which it forms a part as it is located so as to resist the outwardly directed forces normally most effective to remove a security grille from the grille rebates of the surrounding frame members.

Finally, the appearance of frame members constructed in accordance with the present invention is generally superior to that of the frame members currently in use. Reference has been made above to the improved appearance of the preferred screen mesh retaining provisions over the spline rebates of conventional frame members. It has also been noted that the appearance of any retaining rivets or similar members can be made at least comparable to the

appearance of such retaining members in conventional constructions, while also strengthening the retention of the security grille within the grille rebates. These advantages are obtained without undesirably increasing the total width of the frame members and thus detracting from the appearance of finished door or other screen.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An extruded or roll-formed frame member the integral parts of which extend longitudinally in the direction of formation of said member and include a body portion having at least one tongue section which extends laterally in relation to the direction in which the frame member is formed, which is relatively shallow in depth compared with its lateral dimension, and which has a hollow interior defined by opposed inner and outer walls which merge with an end wall at least at their ends remote from the body portion, said frame member further including an arm section spaced from but linked by a further end wall to the inner wall of each tongue section to define an open-mouthed frille rebate between said arm section, said linking end wall and said tongue section inner wall, the arm section and tongue section inner wall defining opposed side walls of said grille rebate, said opposed side walls lying with at least part of their opposed surfaces substantially parallel and wherein the outer end portion of at least one side wall of the grille rebate is offset so as to be spaced outwardly from the interior of the grille rebate whereby the side wall so constructed has at least two portions extending parallel to the opposed side wall with the outermost such portion being spaced at a greater distance from the opposed side wall than its adjacent such portion.

2. A frame member as claimed in claim 1 wherein at least one opposed side wall surface of the grille rebate is formed with inwardly directed ribs.

3. A frame member as claimed in claim 2 wherein the ribs are barbed in cross section with the points of the barbs directed inwardly towards the end wall of the grille rebate.

4. A frame member as claimed in any one of claims 1 to 3 wherein the offset outer end portion forms part of the

arm section.

5. A frame member as claimed in claim 4 wherein a relatively shallow stiffening rebate is formed in the outer surface of the arm section thus bringing the inner surface of

said section closer to the opposing side wall of the grille rebate and making the outer portion of the arm section relatively offset from the stiffening rebate.

6. A frame member as claimed in any preceding claim wherein the body portion further includes a hollow box section merged with each tongue section and from which each tongue section extends outwardly.

7. A frame member as claimed in claim 6 wherein the box section is formed on its inside walls with shallow inwardly directed ribs to assist the location and retention of corner stakes used in the assembly of a frame structure.

8. A frame member as claimed in any one of claims 1 to 5 having two oppositely extending tongue members with their inner ends adjacent.

9. A frame member as claimed in any preceding claim including at least one screen mesh rebate extending transversely to the direction of the grille rebate.

10. A security grille frame constructed from frame members as defined in any preceding claim and including an expanded metal security grille held within the grille rebates of the frame members.

11. A security grille frame as claimed in claim 10 wherein the security grille is retained within the grille rebates by rivets extending through the side walls of the grille rebates and wherein the free ends of the rivet tails are concealed in the interior of the tongue sections.

12. A security grille frame as claimed in claim 10 or in claim 11 wherein a stiffening rebate is formed in the arm section of each frame member and the security grille is held in the grille rebates by rivets the heads of which are accommodated within the stiffening rebate.

13. A frame member as claimed in claim 1 substantially as

herein described with reference to ~~any one of~~ Figure 1 or 2 ~~to 3~~.

14. A security grille frame as claimed in claim 10 wherein the frame members are substantially as herein described with reference to ~~any one or more of~~ Figure 1 or ~~to~~ 2.

15. A method of constructing an insect screen, wherein a plurality of frame members as claimed in any one of claims 1 to 8 are joined to provide an enclosure for the edges of a panel of insect screen mesh, the edges of said panel are inserted into the grille rebates of the respective frame members, and at least one retaining piece is inserted between the offset portion of the side wall of the grille rebate and the screen mesh panel thereby removably retaining the edges of the mesh panel within the rebates.

DATED: 24 August 1992
PHILLIPS ORMONDE & FITZPATRICK
Patent Attorneys For:
McILWRAITH-DAVEY PTY LTD

(3533h)

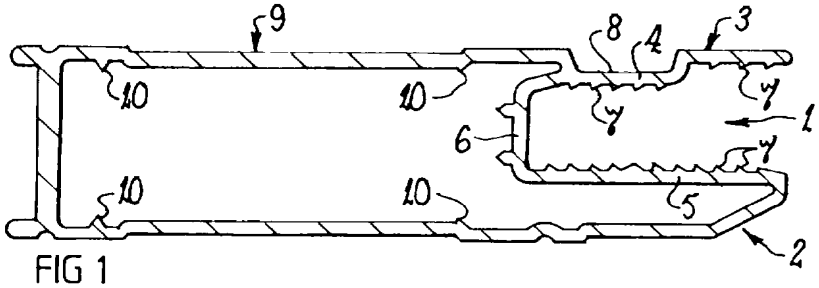

FIG 1

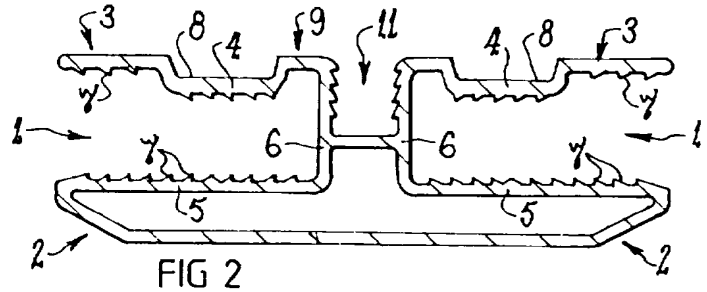

FIG 2

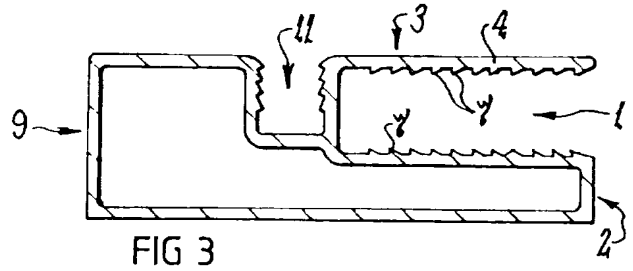

FIG 3

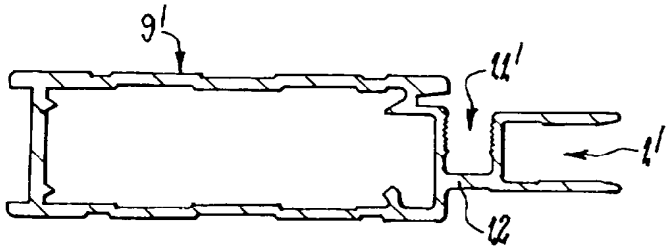

FIG 4